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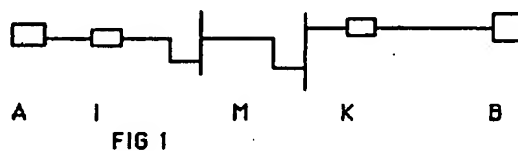
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(54) **Method and arrangement for automatic telephone call answering control.**

(57) Method and arrangement for routing incoming traffic in a communication system where an identity code of a calling party (A) is transferred to a receiving party (B) before the call signal is sent out. The receiving party (B) decides with the aid of the identity code of the calling party (A) whether the call should be answered or not. In those cases where the call is to be answered, the equipment of the receiving party (B) decides which answering station will serve the call and takes care of the interconnection. In those cases where the receiving party (B) has given priority to the calling party (A), the calling party (A) with the higher priority is served with precedence before a calling party (A) with lower priority.



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## TECHNICAL FIELD

In communication systems for, for example, telephony, mobile telephony and so forth, there is a need, in certain circumstances, to automatically direct the incoming traffic after identification of the caller.

## BACKGROUND OF THE INVENTION

In telephony engineering, it is known for a caller to direct himself to a certain extension within, for example, a private branch exchange. To achieve this, it is required that the caller knows the telephone number which is to be taken. The telephone number consists, for example, of a basic number plus an extension number. If this information is lacking, the caller must connect himself via an operator or office.

Providers of data bases and data equipment allow the user to connect himself to the system after identification by, for example, a password. Unauthorised access, however, can be obtained by mistake or by systematic searching for the password. The latter applies to so-called hackers, who attempt to enter a data system for various reasons. Problems with unauthorised access occur in all data systems which are connected to open communication networks, for example the telephone network. To avoid this problem, automatic call back has been introduced. However, unauthorised access occurs even in this system.

Institutions such as insurance firms and weather bureaus have need to automatically direct incoming traffic to extensions which deal with certain geographic areas.

Rescue services have need to identify the location from which help is requested in order to be able to direct rescue missions quickly and correctly and to the right place.

In U.S. patent 317,890, a method is given for selecting calls at the receiving party by the telephone number of the calling party being indicated on a display. The called party can then choose whether the call should be answered or not. However, one disadvantage is that ringing tones emanate. For those who are exposed to, for example, nuisance calls, it is, however, not acceptable that the telephone rings, even if one does not answer.

U.S. patent 4,741,024 specifies an arrangement for transferring a call signal to a telephone set at the receiving party which only comes from a predetermined caller.

## OBJECT OF THE INVENTION

The present invention relates to a method for routing the incoming traffic in a communication

system to predetermined extensions, to prioritize important customers, and to prevent unauthorized callers from connecting themselves to the answering system functions without being authorized.

## SUMMARY OF THE INVENTION

The present invention provides a method for routing calls in a communication system in which a calling party is identified by the receiving party before the call signal is transmitted. In the equipment of the receiving party, a register of authorized callers is provided. Depending on the calling party's identity code, the receiving equipment decides whether the call will be answered or not. Calls to be answered are routed to an extension selected as a function of the identity code.

## DESCRIPTION OF THE FIGURES

Figure 1 shows a communications network with caller A, individual connecting elements I, interconnecting means M, identification equipment K and called party B.

Figure 2 shows identification equipment K, selector V, answering equipment S and refusal to answer C.

Figure 3 shows identification equipment K, selector V and a number of answering functions at telephones T, computer equipment D, telefax equipment F and other equipments O.

Figure 4 shows identification equipment K, access protection P, control element V1, extensions D and answering refusal C.

Figure 5 shows identification equipment K, selector V, and a number of extensions S and operator station T.

## PREFERRED EMBODIMENT

The communication system comprises a calling party A and a receiving party B and means M for interconnecting the parties. A and B are connected to the system via individual connecting elements I (in Figure 1 only the individual connecting element of the calling party is shown). Both A and B have unique identity codes. When a call occurs, the calling party A is identified by the system before calling codes are received by the called party B, or a connection to the called party B takes place. The caller A receives a signal that the system is ready to receive the identity code for the required receiver. Signals are transferred in the system preparing the interconnection of A and B. Information on whether the called party B is free or engaged is transferred in the signal system to the caller A. If the called party is free, information about the identity code of the caller A is transferred

to the called party B before the call signal is sent out to the called party B. The identity code contains information about the geographic origin of the caller A. The called party B identifies the identity code of the caller, in its identification equipment K, which is compared with a register provided at B. The register contains necessary information about which callers A shall be accepted, denied connection or receive special handling.

A called party B which only wishes to answer calls from certain callers designated in advance, or alternatively wishes to refuse certain designated calls, identifies the caller in its identification equipment K. The identification equipment thereafter controls a selector mechanism V, Figure 2, which, depending on whether the call should be answered, connects the caller to the extension S, from where the call signals from the system emanate, after which the call is answered. If the call is not to be answered, no connection to the answering equipment occurs, which has symbolically been indicated by C in Figure 2.

Providers of data bases, data services and so forth wish that only callers approved in advance should have access to the services. The caller A is identified by the called party B in its identification equipment K. If the caller is not listed in B's register of authorized callers, connection is refused at C in Figure 4. If the caller A is approved, he is connected to the system which answers the call in means arranged for access protection P. The access protection requires that the caller A transmits an access code before the control element V1 connects the caller to the extension D for which A is authorized. In those cases where an incorrect access code is given, or an access code is given for connection to services/equipment for which the caller is not authorized, connection of the caller A is refused by connection to C. In systems with sensitive information callers who attempt to connect themselves without being authorized, or authorized persons who attempt to connect themselves to functions for which they are not authorized, are registered. This information about unauthorized persons can be later utilized for tracing and possibly proceeding against those who seek connection to the system without being authorized. Alternatively, a caller who has not been recognized is connected to a special answering function which ascertains who the caller is and decides what measures shall be taken.

In certain lines of business there is a need to route incoming calls to different extensions (Figure 5) in dependence on the geographic origin of the caller A. Incoming calls are identified and categorized by the identification equipment K. With the aid of the identity code of the caller A, his geographic origin can be determined. At the called

party B there are means V for directing traffic to extensions which will serve the respective geographic areas. Requirements of this type are found, for example, in the insurance branch, weather forecasting, rescue services and so forth. Callers who wish information about, for example, the weather outlook request connection in the communication system. The signal paths from the caller A via the interconnecting elements are transferred to the receiving party B. Information about the identity code of the caller A is transferred to the called party B who receives the information and compares the part of the identification code which contains information about the geographic origin with its own register of geographic origins. After the call signal has been received, the internal switching system of the called party B interconnects the called party with the extension intended to serve the designated geographic area. The information is then sent out to the caller A.

A caller A requests connection to a called party B by sending out an identification code. The identification code of the caller A is transferred via the interconnection equipment to the called party B. The equipment of the called party B identifies the caller by comparison of the identification code A with a register arranged at B. If the identification code of the caller is listed in B's register, the caller is given priority before other callers. This is done by the caller A first being put in a possible queue and a special attention signal being sent out to the entity or entities which will take care of the call in the internal communication system of the answering party B. If an interconnection is just about to take place between other callers without priority or lower priority, this interconnection will not take place, but instead the prioritized caller is connected first.

The present invention can be utilized in any communication system whatsoever intended for information transmission where the information about the identification code of the caller is transferred to the called party. Telephony systems, mobile radio systems, data transmission systems can be named as examples.

Figure 3 shows how a call from a caller is received and identified by the called party B in his identification equipment. The caller has arranged registers of different call numbers specifying which type of communication will be utilized. Different functions can be, for example, telephony T, various data services D, various tele services such as, for example, telefax transmission and other services O which are not specified in greater detail here.

In other cases, there is a need for giving certain callers special treatment. This can apply, for example, to certain important customers of an undertaking or to communication between different

rescue centres which should be prioritized in disaster situations. In this case, the identification equipment K identifies the call and establishes that the call has priority. The called answering equipment receives a control signal from the identification equipment K about the prioritized call, which is connected to a free extension before other callers. It is also possible to arrange special extensions with the task of only answering prioritized calls. In rescue services the system is utilized for identifying a caller A and for determining the geographic place of residence, which information has been stored in the data register on callers of the answering function. For example, ordinary subscribers can be divided up in accordance with geographic location, and the identification code of the caller can be specified to the receivers. For specially arranged alarm telephones along roads, for example, the exact address is specified directly. This facilitates direction of the required resources towards the place where help is required. In this way, it is easier for alarm centres, for example, to identify and send help in those cases where the caller is confused, in shock or loses consciousness during the call.

The invention is only limited by the claims below.

#### Claims

1. Method in a communication system, comprising calling parties (A), connected to a first unit, and receiving parties (B), connected to a second unit, the receiving party being provided with at least one answering station, and switching means between said first and second units, which switching means are utilized for interconnecting a calling party (A) and a receiving party (B) for communication exchange between them, in which system both the calling party (A) and receiving party (B) have been allocated unique identity codes, the identity code of the calling party (A) being registered in the first unit, on establishment of communication with the receiving party (B), and the identity code being transferred via the switching means to the receiving party (B), which registers the identity code of the calling party (A) before the communication system transfers the call signal to the receiving party (B), **characterized** in that the receiving party (B) registers the identity code of the calling party (A), which is compared with a register, provided at the receiving party (B), of approved identity codes for calling parties (A), whereupon, in the case where the calling party (A) is listed in the register, the calling party is interconnected with the receiving party (B), and in the case where the calling party (A) is not listed in the register, the calling party is refused connection or switched to a specially arranged answering station.
2. Method according to claim 1, **characterized** in that the identity codes contain information on geographic origin.
3. Method according to any one of the preceding claims, **characterized** in that the setting up of data traffic between the calling party (A) and receiving party (B) is only established if the calling party (A) is registered in the register of the receiving party (B).
4. Method according to any one of the preceding claims, **characterized** in that the calling party (A) is routed to an answering station selected in advance as a function of the identity code of the calling party (A).
5. Method according to any one of claims 1 to 3, **characterized** in that the calling party (A) is interconnected with an answering station at the receiving party (B) in dependence of the geographic origin of the calling party (A).
6. Method according to any one of the preceding claims, **characterized** in that the calling parties (A) are categorized, whereby a calling party allocated the higher priority receives precedence before a calling party with lower priority.
7. Arrangement in a communication system comprising calling equipments (A), connected to first units, and receiving equipments (B) connected to second units, the receiving equipments being provided with at least one answering equipment, and switching means between the first and second units, which switching means are utilized for interconnecting a calling equipment (A) and a receiving equipment (B) for communications transmission between them, and both the calling equipment (A) and receiving equipment (B) have been allocated unique identity codes and the identity code of the calling equipment (A) is registered in the first unit, on establishment of communication with the receiving party (B), and the identity code is transferred via the switching means to the receiving equipment (B) which registers the identity code of the calling equipment (A) before the communication equipment transfers the call signal to the receiving equipment (B), **characterized** in that the receiving equipment (B) registers the identity code of the calling equipment (A), which is compared with a register.

ter arranged in the receiving equipment (B) of approved identity codes for calling equipments (A), whereby the calling equipment (A) which is listed in the register is interconnected with the receiving equipment (B) for communication transmission, and the calling equipment (A) which is not listed in the register of the receiving equipment (B) is refused connection or interconnected to a specially arranged answering station.

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8. Arrangement according to claim 7, **characterized** in that the identity codes contain information on geographic origin.

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9. Arrangement according to any one of claims 7 or 8, **characterized** in that the setting up of data traffic between a calling equipment (A) and receiving equipment (B) is only established if the calling equipment (A) is registered in the register of the receiving equipment (B).

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10. Arrangement according to any one of claims 7 to 8, **characterized** in that the calling equipment (A) is routed towards an answering station selected in advance as a function of the identity code of the calling equipment (A).

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11. Arrangement according to any one of claims 7 to 9, **characterized** in that the calling equipment (A) is interconnected to an answering station at the receiving equipment (B) in dependence of the geographic origin of the calling equipment (A).

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12. Arrangement according to any one of claims 7 to 11, **characterized** in that the calling equipments (A) are categorized, whereby a calling equipment which is allocated the higher priority receives precedence before a calling equipment (A) with lower priority.

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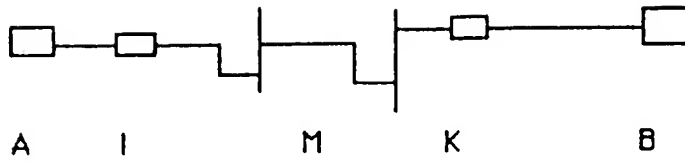


FIG 1

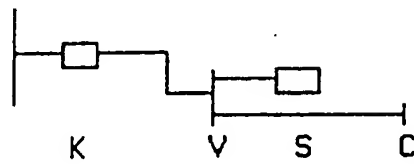


FIG 2

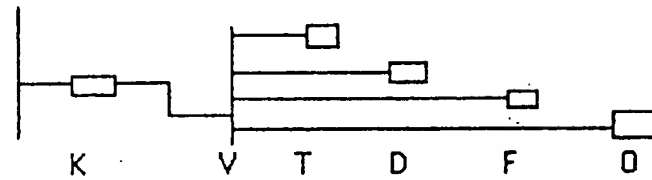


FIG 3

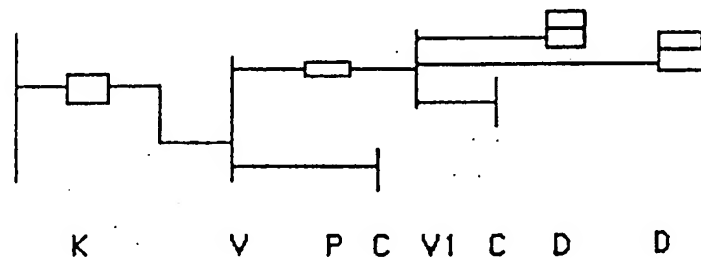


FIG 4

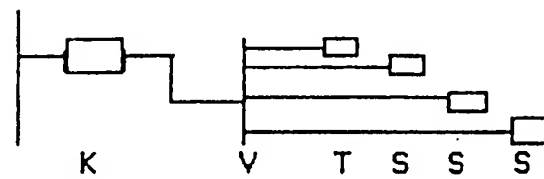


FIG 5



European Patent  
Office

## EUROPEAN SEARCH REPORT

Application Number

EP 92 85 0304

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
X	US-A-4 277 649 (SHEINBEIN) * column 2, line 30 - column 10, line 44; figures 1-9 * ---	1-12	H04M1/66 H04M3/38
X	US-A-5 029 196 (MORGANSTEIN) * column 2, line 60 - column 13, line 8; figures 1-4 * ---	1-5,7-11	
Y	WO-A-9 112 685 (LAU) * page 5 - page 28; figures 1-7 * ---	1,3,7,9, 10	
Y	PATENT ABSTRACTS OF JAPAN vol. 9, no. 310 (E-364)(2033) 6 December 1985 & JP-A-60 146 563 ( NIPPON DENWA KOSHA ) * abstract * ---	1,3,7,9, 10	
A	EP-A-0 330 856 (MOTOROLA) * column 4, line 9 - column 15, line 7; figures 1-5 * ---	1,3,7,9, 10	TECHNICAL FIELDS SEARCHED (Int. Cl.5)
A	US-A-5 062 133 (MELROSE) * column 2, line 63 - column 11, line 63; figures 1-3 * -----	1,3,7,9, 10	H04M
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 30 JUNE 1993	Examiner DELANGUE P.C.J.
<b>CATEGORY OF CITED DOCUMENTS</b> X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ----- & : member of the same patent family, corresponding document			

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